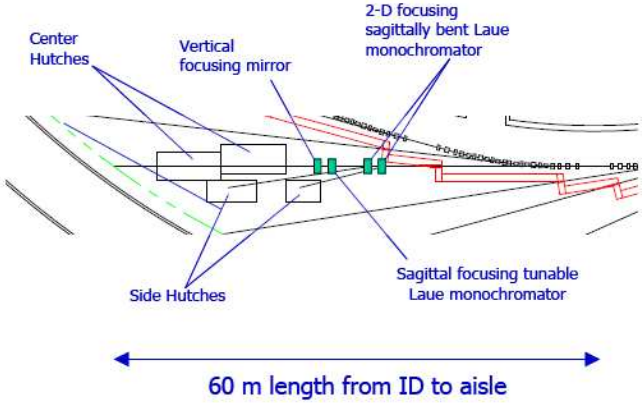
Breakout Session
“Materials at High Pressure”
wrap up

Scientific Drivers

- Disordered and non-crystalline materials
  - Nano-crystalline Materials
  - Liquids and Melts
  - Partially crystalline Materials and Mineral Inclusions
    - Elasticity
    - Density
    - Structure
- Reactions
  - In situ investigations
  - Time resolved studies
- Single-crystal diffraction
  - In polycrystalline matrix

- Earths' & Planetary interior
  - Inner structure of planetary bodies
  - Subduction zones & earth quakes
  - Differentiation
  - Core structure/composition
- Materials
  - Synthesis of novel materials
  - Reaction & formation mechanisms
  - Highly correlated electron systems
  - Structure-property relationships

Proposed Beamlines



- High Pressure Diffraction
  - Super conducting Wiggler
  - 4 End-Stations
    - 2 Fixed Energy Stations
    - DAC: E ~ 35-40 keV, ~1 μm
      - Laser heating (Yt:fiber laser,CO_2),Low temperature capabilities, Imaging capabilities
    - LVP: E ~ 35-40 keV
      - 500 t Press with interchangeable modules
    - 2 Variable Energy Station
    - DAC: E ~ 20-100 keV
      - Laser heating (Yt:fiber laser,CO_2),Low temperature capabilities, Imaging capabilities
    - LVP: monochromatic & white beam capabilities
      - 2000 t Press with interchangeable modules

Proposed Beamlines

- Infrared Spectroscopy beamline
  - Bending magnet
    - Unique & World class program at NSLS $\rightarrow$ NSLS-II
- Inelastic Scattering and Spectroscopy beamline
  - Undulator (U19) E ~ 5-25 keV
  - Taking full advantage of unique source characteristics of NSLS-II
  - XAS, XES, IXS, RIXS, NRIXS, NFS

Support Laboratory

High Pressure will be an important sample environment also on beamlines not dedicated to high pressure

- Gas loading
- Preparation Area
  - Microscopes
  - Mechanical, spark erosion and laser micro-drill system
  - Staging
  - Inert atmosphere loading / glove box
  - Fume hood, Furnaces
- Off line Raman system
- Off line laser heating system
- Micro-engineering capabilities for sample and gasket preparation

Analytical capabilities $\rightarrow$ Center for Functional Nanomaterials, other BNL Institutes

- Focused Ion Beam analysis (FIB)
- SEM/TEM
- Micoprobe

Beamline Advisory Team

- Ongoing discussion about team members
- 10 Team Member
  - Preparation of the LOIs for dedicated high pressure beamlines
  - Interface to beamlines which plan to have high pressure as a sample environment